

US Army Handheld Fire Extinguisher Hardware Development for Use with Blended HFC-227ea/Sodium Bicarbonate Agent

Lenny Lombardo

The U.S. Army Aviation Ground Support Equipment (AGSE) Product Management Office was tasked to develop and test a suitable replacement for the Ozone Depleting Substance 2.75-lb Halon 1301 handheld fire extinguisher (HHFE) currently mounted on the legacy rotary wing weapon systems. To prevent the need for weapon system redesign, the replacement cylinder had to maintain the same dimensions as the current HHFE. Modifications in extinguisher hardware, pressurization gases, pressures, fill ratios, and discharge rates were necessary to achieve the same fire fighting performance as the current 2.75-lb Halon HHFE.

Various candidate clean agent replacements were tested to determine suitability as a replacement. Hardware design, especially nozzle design, had to be tailored to the physical characteristics of each candidate agent. The addition of sodium bicarbonate to enhance fire fighting performance also heavily influenced nozzle design.

Various issues were identified during testing. The blended HFC-227ea/sodium bicarbonate agent presented challenges with respect to filling the extinguishers with a consistent concentration of sodium bicarbonate. In addition, the extreme temperature qualification testing highlighted issues in the assembly of the valve. These challenges were overcome to obtain a suitable replacement to the halon 1301 HHFE.